INTERACTIVE MEDICAL LABORATORY SPECIMEN APPARATUS SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to an interactive medical laboratory specimen testing apparatus system wherein a diagnostic apparatus is used in performing a diagnostic routine on a specimen. The apparatus has a single user activated switch for causing automatic dialing of a source of assistance remote from the diagnostic apparatus through a predetermined telephone number when the switch is activated to enable the user to communicate with the source of assistance through a speaker and a microphone on the diagnostic apparatus so that interactive communication with the source of assistance can be had regarding the diagnostic apparatus and the routine to be performed. A keyboard on the apparatus allows certain data regarding the performance of a test and operation of the apparatus to be transmitted to a remote location for analysis.

In commonly assigned co-pending application Ser. No. 740,100 filed May 31, 1985 and entitled TRANSVERSE FLOW DIAGNOSTIC DEVICE, applicant disclosed a diagnostic device for analyte assay which permits top, bottom and straight through reading of the filter means to determine the results of the test. In the device, the fluids and reactants necessary to carry out the tests are caused to flow outwardly through the filter means from a reaction zone at the point of application of the fluid to a localized portion of the top surface of the filter to peripheral portions in the filter so that no fluid passes completely through the filter at the point of application. The result of the reaction of the materials on the filter can then be viewed from either the top, or the bottom or with a read through device so that the user can be apprised of the results. In the prior art, diagnostic apparatus exists which pass a light through or reflect the light from the filter in order to obtain a reading representing the results of the reaction.

The diagnostic apparatus is normally designed with predetermined calibration data so as to generate the proper operating parameters for a particular test, to adjust the intensity of a light beam for a particular test, or to adjust a particular voltage level or provide other data. Once the apparatus has been properly calibrated and adjusted, the device containing the reaction products is placed in the diagnostic apparatus where a light is passed through or reflected from the filter and the apparatus automatically provides the results of the test. Some of the problems of the prior art occur during the time the apparatus is being calibrated or adjusted for a particular test while other problems may occur during the test itself. When such problems occur, the user of the diagnostic apparatus has to go to the nearest phone and call the maker of the apparatus at a remote location, typically a predetermined service instruction or assistance telephone number, where questions can be asked in order to attempt to solve the problems. After obtaining advice from the manufacturer, the user then goes back to the diagnostic apparatus and attempts to correct the problem based on the information received. If problems still occur, he must go back to the telephone and make additional calls as required. This procedure involves not only an inconvenience in attempting to find a phone at some distance removed from the diagnostic apparatus, but requires the user to discuss the problem without having the diagnostic apparatus in view unless the telephone happens to be placed at or near the diagnostic apparatus location.

The present invention overcomes the obstacles and problems of the prior art by placing a single user activated switch on the diagnostic apparatus which causes automatic dialing of a predetermined telephone number at a remote location to contact the manufacturer or source of assistance. A microphone and a speaker are also included on the diagnostic apparatus so that the user, once having activated the single switch, can communicate with the manufacturer or source of assistance at the predetermined telephone number and thereby communicate with the manufacturer while the user is actually utilizing the diagnostic apparatus to perform a test. In addition, each diagnostic apparatus has associated with it an identification code which is automatically transmitted to the manufacturer or source of assistance so that the particular diagnostic apparatus has a unique identification for use by a computer at the manufacturer or source of assistance. Further, the diagnostic apparatus has a keyboard thereon for the user to input data to calibrate the device or adjust the device for a particular operation or test. The manufacturer can then verbally instruct the user of the device to enter a particular code into the apparatus through the keyboard which will generate a data transmission to the manufacturer which can be analyzed by the manufacturer to determine whether or not the instrument is functioning properly. A variety of such data transmissions can be sent including calibration, voltage levels, and the like. Further, the identification number of the diagnostic apparatus can be utilized by the manufacturer to always provide an assistance request by the same customer representative so that continuity of service can be provided.

Thus it is an object of the present invention to provide a diagnostic apparatus which allows interactive communication from the apparatus itself to a source of assistance.

It is a further object of the present invention to provide a diagnostic apparatus for use in performing a diagnostic routine on a specimen which includes a single user activated switch on the diagnostic apparatus for causing automatic dialing of a source of assistance through a predetermined telephone number when the switch is activated.

It is still a further object of the present invention to include a microphone and a speaker on the diagnostic apparatus which are coupled by the single user activated switch to the source of assistance at the predetermined telephone number such that when the single switch is activated, interactive communications regarding the diagnostic apparatus and the routine to be performed with the apparatus is obtained with the source by means of the predetermined telephone number and the speaker and microphone.

It is still another object of the present invention to convert selected operating parameters of the diagnostic apparatus to data for transmission to the source of assistance when a control code is generated with the use of the keyboard on the diagnostic device thereby transmitting selected data concerning the diagnostic device to the source of assistance for analysis.

It is yet another object of the present invention to provide a multiplicity of customer representative terminals at the source of assistance with data from a diagnostic apparatus with a predetermined identification to be